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Status Report

OAK MORTALITY IN SIX SOUTH CENTRAL STATES

U. S. Forest Service
Pineville, Louisiana

U. S. DEPARTMENT OF AGRICULTURE -- FOREST SERVICE
SOUTHEASTERN AREA, STATE AND PRIVATE FORESTRY
RESOURCE PROTECTION UNIT, FOREST INSECT AND DISEASE MANAGEMENT GROUP

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OAK MORTALITY IN SIX SOUTH CENTRAL STATES

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Much attention has been focused upon a number of dead or dying oaks in the states of Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, and Texas. Responses from cooperators in these states have indicated that this condition has been developing within the past 2 years.

Previously, unexplained oak decline and mortality occurred in certain decades in the United States. In 1930, Pennsylvania reported extensive areas of oak dieback. In the early 1960's there were vast areas of oak dieback and mortality in the Southeast (2). Both Staley (4) and Nichols (3) have made detailed inquiries into the cause of such decline and mortality of oaks from Pennsylvania to North Carolina. They have concluded that this oak decline and mortality is usually the result of a sequence of events brought about by climatic impact, i.e., drought, frost, etc., followed by insect defoliation and fungi invasion.

The purpose of this report is to document the status of the oak mortality situation in the aforementioned states.

Information relevant to oak mortality within this report was provided by Forest Supervisors and State Foresters in six states. In addition, four service trips were made by State and Private Forestry personnnel, Alexandria Field Office. Three trips were made to Southern Arkansas and one made to National Forests in East Tesas. An aerial survey of Northern Louisiana was conducted by L. H. Nachod, Staff Forester, of the Louisiana Forestry Commission, and laboratory analysis support was provided by T. H. Filer, Pathologist, Southern Forest Experiment Station. The aerial survey of Northern Louisiana from Minden to Monroe revealed a mortality of seven trees per thousand acres.

Oak mortality impact appears to be greatest in Southern Arkansas and East Texas, with the remaining states reporting lesser amounts of mortality. The following chart gives a summary of the distribution of oak mortality and major oak groups or species affected in the six South Central States.

State	Oak Groups	Distribution
Alabama	Red Oak group	Northwestern part of state around Bankhead National Forest.
Arkansas	Post oak, southern red, black oak, and white oak	Southern 1/3 to 1/2 part of state on Ouachita National Forest.
Louisiana	White and red oak group	Northern Louisiana around Webster and Ouachita Parishes.
Mississippi	Post oak, Southern red oak	Tombigbee and Black Creek Ranger Districts on DeSoto National Forest.
Oklahoma	Post oak	Tiak Ranger District, Southeastern part of state on Ouachita National Forest.
Texas	Post oak, red oak, water oak, and willow oak.	East Texas.

SYMPTOMATOLOGY

Symptoms associated with this oak mortality are similar in all areas. Generally, the foliage fades and turns brown in part or all of the crown. Dead leaves usually persist on limbs except with post oak in Texas where there is considerable leaf drop. Vascular discoloration has been observed in some damage samples collected from symptomatic oaks on National Forests in Texas. All sizes of trees appear to be affected, but the condition seems to be more prevalent in older trees. Trees are usually affected singly and rarely in groups (Figs. 1, 2, and 3).

PROBABLE CAUSES OR CONTRIBUTING FACTORS

No one factor can be cited as being entirely responsible for the existing oak situation. One important fact noted in Alabama, Arkansas, Louisiana, Mississippi, and Texas is that this problem seems to be particularly apparent in areas where man-made influences

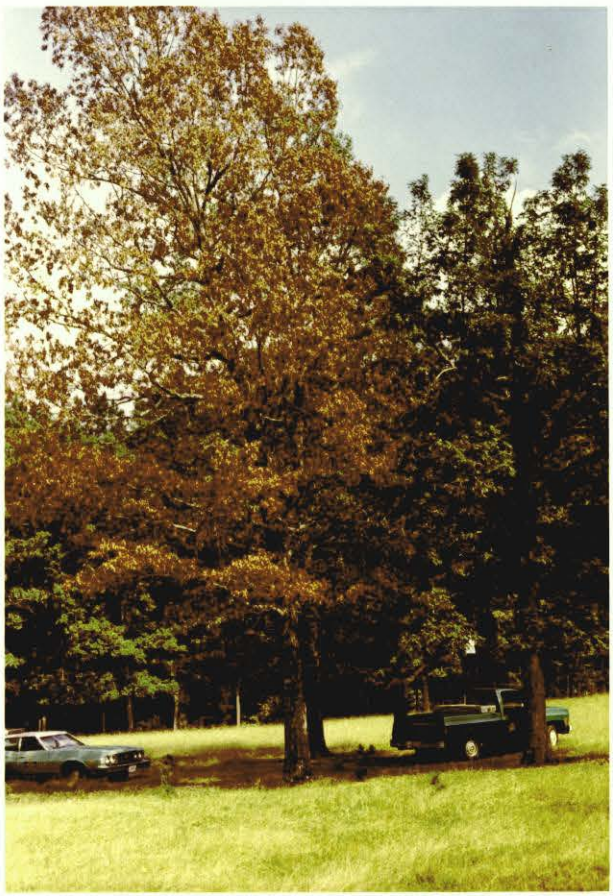

Fig. 1. Dead Southern red oak in pasture, Cairo, Ark.

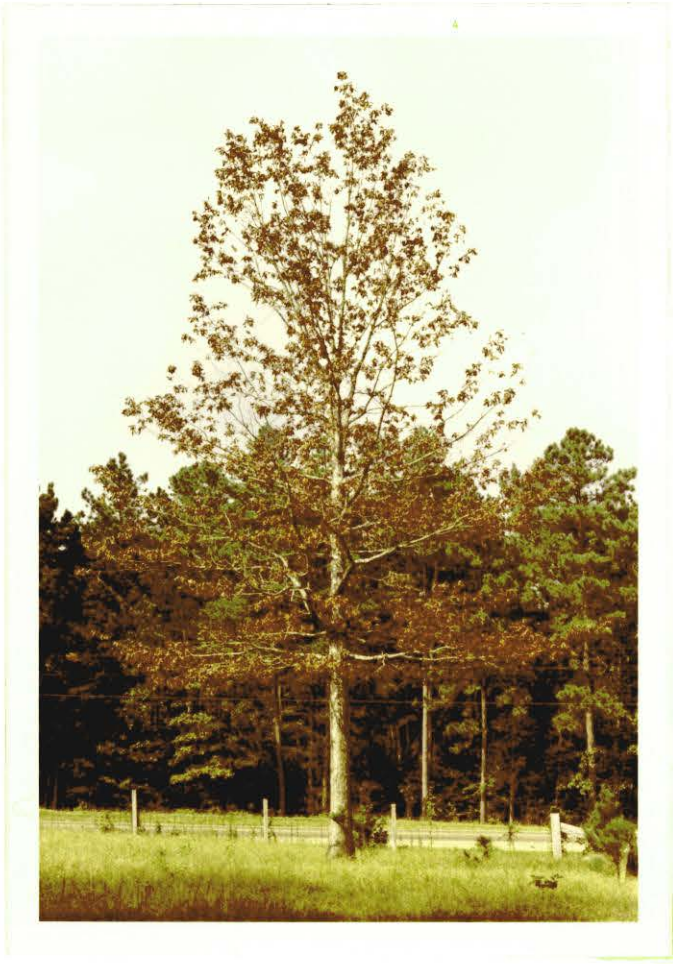

Fig. 2. Dead white oak in pasture Cairo, Ark.

Fig. 3. Dead Southern red oak in schoolyard, Amity, Ark.

are greatest -- in areas such as homeowner's yards, pastures construction sites, cleared areas, etc.

Laboratory analyses from damage samples collected in Arkansas have revealed the presence of two potential pathogens: *Cephalosporium* sp. and *Gleosporium* sp. A *Cephalosporium* sp. has previously been associated with a live oak decline in Texas (1), but the specific identity and pathogenicity of the *Cephalosporium* sp. isolated from oaks in Arkansas has yet to be established.

All states report that mild winters and unusually wet spring and summer months of the last 2 years may have some relationship to the mortality and decline. In 1973 and 1974, rainfall was 20 inches above normal in Alabama, 16 inches above normal in northern Louisiana, and 19 inches above normal in southern Arkansas.a/

DISCUSSION AND RECOMMENDATION

An unusual amount of oak mortality and decline have been noted over the past two years in a six state area. This problem is reported to be most severe in southern Arkansas and in east Texas. The number of trees involved appears small in most of the area; however, survey data is needed to determine how much of the resource may be affected.

Reaction by landowners has been mixed. In many areas, the affected oaks are in pastures and other openings and have little commercial value. In this case, there has been little immediate concern with the problem. The value of oak trees increases where there are timber markets and when aesthetic or landscape values are involved. As expected, more concern was expressed as these higher value trees died.

Some additional evaluation effort is needed to determine the cause, extent, and severity of this problem.

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a/ These figures are averages from Annual Summary for Alabama, Arkansas, and Louisiana, Climatological Data, U. S. Dept. of Commerce, National Weather Service, 1973 and 1974.

Recommendation for summer 1976 work:

1. Contact cooperating agencies in the six state area and ask them to report oak mortality and decline.

2. In cooperation with agencies involved, conduct aerial detection surveys on selected areas of:
   -- National forests in east Texas
   -- State and private land in southern Arkansas

3. Work to identify the causes of the problem in cooperation with the Southern Forest Experiment Station and where appropriate, with state agencies and universities.

4. Coordinate evaluation efforts with the Southeastern Area, State and Private Forestry field office in Asheville and, as appropriate, Northeastern Area, State & Private Forestry in Upper Darby, Pa.

LITERATURE CITED

1. Halliwell, R. 1966. Association of *Cephalosporium* with a Decline of Oak in Texas. PDR50(2):75-78.

2. Hepting, G. 1971. Diseases of Forest and Shade Trees of the United States. USDA Forest Service. Agriculture Handbook Number 386, 658 pp.

3. Nichols, J. 1968. Oak Mortality in Pennsylvania: A 10-Year Study. Jour. Forestry 66:681-694.

4. Staley, J. 1965. Decline and Mortality of red and scarlet oaks. For. Sci. 11:2-17.